Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for microencapsulating an agent comprising:

forming, at a first temperature, ~~a emulsion~~ an emulsion which comprises aqueous microdroplets, including the agent and a cross-linkable matrix material, dispersed in a hydrophobic continuous phase comprising an oil and an oil-soluble surfactant, the first temperature being below the temperature effective to initiate cross-linking of the matrix material; and

heating the emulsion to a temperature and for a time effective to cause the matrix material to self-crosslink, to form microparticles comprising the agent encapsulated by the crosslinked matrix material.

2. (Original) The method of claim 1, wherein the agent comprises a magnetic material.

3. (Original) The method of claim 2, wherein the magnetic material comprises iron, nickel, or cobalt.

4. (Original) The method of claim 3, wherein the magnetic material comprises maghemite.

5. (Original) The method of claim 1, wherein the agent comprises nanoparticles having a number average diameter between 5 nm and 50 nm.

6. (Original) The method of claim 5, wherein the nanoparticles are superparamagnetic.

7. (Original) The method of claim 6, wherein the superparamagnetic nanoparticles comprise iron, nickel, or cobalt.

8. (Original) The method of claim 7, wherein the superparamagnetic nanoparticles comprise maghemite.

9. (Original) The method of claim 1, wherein the matrix material is biodegradable.

10. (Original) The method of claim 1, wherein the matrix material comprises a protein.

11. (Original) The method of claim 1, wherein the matrix material comprises an albumin.

12. (Original) The method of claim 1, wherein the matrix material comprises a human serum albumin.

13. (Original) The method of claim 1, wherein the agent comprises a drug.

14. (Original) The method of claim 1, wherein the agent comprises a diagnostic agent, an inorganic fertilizer, or an inorganic pigment.

15. (Original) The method of claim 1, wherein the microparticles have a number average diameter between 100 and 1000 nm.

16. (Original) The method of claim 1, wherein the microparticles have a number average diameter between 300 and 800 nm.

17. (Original) The method of claim 1, wherein the oil is a vegetable oil or a mineral oil.

18. (Original) The method of claim 1, wherein the oil soluble surfactant is selected from the group consisting of sorbitan esters, polyoxyethylene ethers, glycerol esters, sucrose esters, diblock copolymers of polyoxyethylene and polyoxypropylene, and triblock copolymers of polyoxyethylene and polyoxypropylene.

19. (Original) The method of claim 1, wherein the oil soluble surfactant comprises sorbitan sesquioleate.

20. (Original) The method of claim 1, wherein the emulsion is formed by sonication.

21. (Original) The method of claim 1, wherein the step of heating the emulsion comprises mixing the emulsion into a quantity of a heated oil.

22. (Original) The method of claim 1, further comprising isolating the microparticles from the hydrophobic continuous phase.

23. (Original) The method of claim 1, further comprising adsorbing a protein-binding ligand onto the microparticles.

24. (Original) The method of claim 23, wherein the protein-binding ligand is selected from the group consisting of avidin, biotin, streptavidin, and lectins.

25. (Currently Amended) A method for microencapsulating an agent comprising:

forming, at a first temperature, ~~a emulsion~~ an emulsion which comprises aqueous microdroplets, including the agent and a cross-linkable matrix material which comprises a protein, dispersed in a hydrophobic continuous phase comprising an oil soluble surfactant, the first temperature being below the temperature effective to initiate cross-linking of the protein; and

heating the emulsion to a temperature and for a time effective to cause the protein to self-crosslink, to form microparticles comprising the agent encapsulated by the crosslinked matrix material.

26. (Original) The method of claim 25, wherein the agent comprises maghemite.

27. (Original) The method of claim 25, wherein the protein comprises an albumin.

28. (Original) The method of claim 23, further comprising modifying the microparticles with lectin or other carbohydrate binding protein effective for coupling with red blood cells.

29. (Currently Amended) A composition comprising a microencapsulated agent made by a method comprising:

forming, at a first temperature, a emulsion which comprises aqueous microdroplets, including the agent and a cross-linkable matrix material, dispersed in a hydrophobic continuous phase comprising an oil soluble surfactant, the first temperature being below the temperature effective to initiate cross-linking of the matrix material; and

heating the emulsion to a temperature and for a time effective to cause the matrix material to self-crosslink, to form microparticles comprising the agent encapsulated by the crosslinked matrix material.

30. (Original) The composition of claim 29, wherein the agent comprises a magnetic material.

31. (Original) The composition of claim 29, wherein the microparticles have a number average diameter between 300 and 800 nm.

32. (Original) The composition of claim 29, wherein the agent is in the form of nanoparticles having a number average diameter between 5 nm and 50 nm.

33. (Original) The composition of claim 29, wherein the agent comprises a drug.

34. (Original) The composition of claim 29, wherein the matrix material comprises a protein.

35. (Original) The composition of claim 29, wherein the agent comprises maghemite in the form of nanoparticles having a number average diameter between 5 nm and 50 nm, the matrix material comprises an albumin, and the microparticles have a number average diameter between 300 and 800 nm.

36. (Currently Amended) A composition comprising magnetic microparticles comprising:

microparticles comprised of a crosslinked matrix material and an encapsulated magnetic material in the form of nanoparticles having a number average diameter between 5 nm and 50 nm, wherein the microparticles have a number average diameter between about 300 and about 800 nm and the matrix material comprises a protein.